INVESTIGATIONS FOR IMPROVEMENTS TO THE PRIMARY CHANNEL AT THE TFCF

Investigators

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Summary

This study will continue investigating rehabilitating the primary fish collection system at the Tracy Fish Collection Facility (TFCF). The primary fish collection system is the first mechanism for separating fish from Sacramento-San Joaquin River Delta (Delta) flows approaching the C.W. Bill Jones Pumping Plant. Fish enter the primary channel and encounter a single line of louvers that extends approximately 320 feet at a 15 degree angle to the flow. Louvers guide fish into any of four 6-inch bypass columns. The bypass columns transition into 36-inch pipes that transport the fish into the secondary channel. The current system is over 50 years old and needs to be evaluated for rehabilitation to improve fish salvage efficiencies at the TFCF based on the National Marine Fisheries Service Biological Opinion of 2009 which states that the TFCF must "Implement specific measures to reduce pre-screen loss and improve screening efficiency at Federal facilities" (National Marine Fisheries Service, 2009). In FY12 a small amount of funds were made available to begin investigations on rehabilitating the primary channel. While those funds were a good beginning at looking at upgrading the primary, more work is necessary to determine other design considerations.

Problem Statement

Since the construction of the primary channel over 50 years ago many new facilities have been built in the South Delta that influence the flow and timing of water arriving at the facility. These changes have prevented the primary louvers and bypass pipes from consistently meeting minimum criteria regarding bypass ratios and velocities that were set to efficiently salvage fish with minimal mortality. In addition debris loads on the primary louvers continues to be a maintenance issue. In order to clean clogged louvers, individual louver panels must be raised and spray washed. When this occurs fish can pass through the

lifted section of the louvers. This includes both letting predators in and listed species out of the primary channel. This research project will investigate screening concepts that will improve the primary channel cleaning and fish collection process. Similar research was completed for the secondary channel which evolved into the scheduled replacement of the secondary louvers with Hydrolox traveling screens in spring 2013. In FY12 researchers were able to determine that replacing the primary channel louvers with Hydrolox traveling screens would be the best option for meeting the 2009 biological opinion. Preliminary data indicated that it might be possible to use the existing primary channel louver guides with new traveling screens. Hydrolox representatives have been contacted and additional time and data are required for both Reclamation Technical Service Center (TSC) and Hydrolox to develop appraisal level drawings.

Goals and Hypotheses

Goal: Continue to investigate possible improvements to the primary channel which will improve the salvage efficiencies of the TFCF, including looking at replacing the louvers with traveling screens similar to those that are scheduled to be installed in the secondary channel.

Materials and Methods

Investigations (literature review, preliminary sizing, space limitations, etc.) will focus on replacing the existing louvers with Hydrolox traveling screens that can improve the salvage efficiencies of the primary channel. This will reduce pre-screen loss by preventing excess build-up of debris and allow the screens to be left in place to limit the fish loss during the lifting and cleaning of the current primary louvers at the facility. In addition, methods to reduce the exposure time against the louvers and screens will be investigated. Ideas and methods will first be developed conceptually and then if necessary modeled in the Hydraulics Lab in Denver, CO. A site visit will be made to meet with Hydrolox representatives at the TFCF to discuss design issues. The FY12 work began the process of showing that replacing the primary louvers with traveling Hydrolox screens while utilizing the existing louver guides should be possible.

Coordination and Collaboration

The study will be coordinated between the TSC, Mid Pacific Region and TFCF staffs and the interagency Tracy Technical Advisory Team (TTAT) through regular updates and meetings.

Endangered Species Concerns

This study will not require permitting.

Dissemination of Results (Deliverables and Outcomes)

This study will enable TSC researchers to develop concepts that could be used to improve salvage efficiencies in the primary channel at the TFCF. Technical memorandums describing possible improvements will be provided to TFCF personnel by October 2013. Appraisal-level drawings (not costs) will be included in the technical memorandum.

Literature Cited

National Marine Fisheries Service. 2009. Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project. National Marine Fisheries Service, Southwest Region. Long Beach, CA.